Solving 0/1 Knapsack Problem Using Hybrid HS and Jaya Algorithms

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Knapsack problem is a combinatorial optimization problem, where a fixed-size Knapsack must be filled with the most valuable items. Solving knapsack problem consider NP hard problem and many previous research tried to find optimal solution for it. In this research, a new hybrid algorithm of Harmony search and Jaya search algorithms applied on 0/1 Knapsack problem to find a near optimal results. HS algorithm has been modified to handle the 0/1 Knapsack problem, such as adding penalty function to cope the weight condition, exclude the harmony search bandwidth (bw) parameter, and use the current best result in the next iteration to obtain a better result. The new hybrid algorithm has been applied on different cases of Knapsack problem with different dimensions. 20 case studies have been evaluated by the new hybrid algorithm. The results obtained are competitive to previous HS variants that used to solve Knapsack problem.

Keywords: Meta-heuristics, Hybrid Algorithm, Harmony Search, Jaya Algorithm, Knapsack Problem.